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NOTICE OF ALLOWANCE AND FEE(S) DUE

22850 7590 07/22/2011
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

DEXTER, CLARK F

ART UNIT

PAPER NUMBER

3724

DATE MAILED: 07/22/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,479	04/12/2006	Satoru Nishio	289353US3PCT	3427

TITLE OF INVENTION: DISK-SHAPED TOOL WITH VIBRATION REDUCTION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	10/24/2011

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE** OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

22850 7590 07/22/2011

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1940 DUKE STREET

ALEXANDRIA, VA 22314

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/575,479 04/12/2006

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TITLE OF INVENTION: DISK-SHAPED TOOL WITH VIBRATION REDUCTION

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nonprovisional	NO	\$1510	\$300	\$0	\$1810	10/24/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
DEXTER, CLARK F	3724	083-676000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB-112) attached;

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB-47, Rev. 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

1

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2

3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.111. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reuply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

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EXAMINER

DEXTER, CLARK F

ART UNIT

PAPER NUMBER

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 242 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 242 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability**Application No.**

10/575,479

Applicant(s)

NISHIO ET AL.

Examiner

CLARK F. DEXTER

Art Unit

3724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the response filed on January 12, 2011.
2. ☒ The allowed claim(s) is/are 1-4.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☒ including changes required by the attached Examiner's Amendment ~~Comment or in the Office action of Paper No./Mail Date .~~
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date ____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Edward Tracy on July 12, 2011.

2. The application has been amended as follows:

In the Claims

Claim 1 has been rewritten as follows:

-- Claim 1 (Currently Amended): A disc-shaped tool comprising:

a plurality of overlapping virtual regions so formed as to be surrounded by two radius lines extending from a rotation center of a disc-shaped base metal and two concentric circles on the base metal disposed around the rotation center, said virtual regions overlapping continuously in a circumferential direction on the disc-shaped base metal, each virtual region overlapping each adjacent virtual region in the circumferential direction, while an entire slit is provided in each one of the virtual regions, the slit making contact with all of the two corresponding radius lines and the two concentric circles, wherein the slits all make contact with the same two concentric circles.

wherein each end portion of each slit extends so as to form an arc that is substantially coincident with a respective one of the concentric circles.

wherein a virtual region angle around the rotation center formed by the two radius lines from a same virtual region is equal to or less than 90° ;

the virtual regions are 4 to 24 in number;

a central concentric circle located in a center of an interval of the two concentric circles forming the virtual region is in a range of $0.6r$ to $0.8r$ with respect to the rotation center of the base metal when a maximum gullet bottom radius of the base metal is r ;

an overlapping of the virtual regions continuously adjoining each other is in a range of 0° to 12° in terms of a central angle around the rotation center, the central angle formed by two radius lines from adjacent virtual regions;

a minimum distance between adjacent slits is equal to or more than $0.05r$; and

a ratio q of a length of an arc of the central concentric circle extending across all of the virtual region with respect to a radial distance between the interval of the two concentric circles in the virtual region is $3 \leq q \leq 6$ ~~3 to 6~~--.

Claim 4 has been rewritten as follows:

-- Claim 4 (Previously Presented): The disc-shaped tool according to claim 1 wherein 3-5 teeth are arranged at an edge of the base metal within each virtual region.--.

In the Specification

- Page 1, line 13, "proposed as" has been changed to --proposed for--;
line 19, a comma --,-- has been inserted after "vibration".
- Page 2, line 22, "single" has been deleted.
- Page 3, line 7, "neighborhood" has been deleted;
line 8, --q-- has been inserted after "ratio".
- Page 4, line 5, --q-- has been inserted after "ratio";
line 14, --q-- has been inserted after "ratio";
line 18, --the-- has been inserted before "case".
- Page 5, line 4, "neighborhood" has been deleted,
line 21, "resent" has been changed to --present--.
- Page 8, line 2, "single" has been deleted;
line 4, "single" has been deleted;
line 26, "neighborhood" has been deleted.
- Page 9, line 1, --q-- has been inserted after "ratio".
- Page 10, lines 2-3, "(not shown)" has been changed to --(not labeled)--.
- Page 11, line 2 from the bottom, --100-- has been inserted after "circular saw blade".

The replacement paragraph on page 2 of the amendment filed on May 20, 2010 which replaced the second paragraph on page 8 of the specification has been rewritten as follows:

-- As for the slit 14, a virtual region angle θ_r formed by the two radius lines 13a, 13b around the rotation center is substantially 34° and is divided in terms of the virtual region angle into three sections, forward small-diameter portion 14a, central inclined portion 14b and rearward large-diameter portion 14c, which are formed continuously as viewed from the forward side in the rotation direction. A radius of the forward small-diameter portion 14a is substantially $0.64r$ and a radius of the rearward large diameter portion 14c is substantially $0.76r$. Here, "r" indicates a radius of a maximum gullet bottom radius of the base metal 11, that is, a radius from the center of the base metal to a root of the tooth 12. The central inclined portion 14b is disposed obliquely between the forward small-diameter portion 14a and the rearward large-diameter portion 14c and a joint portion which is a boundary between the forward small-diameter portion 14a and the rearward large-diameter portion 14c is formed into an arc shape. As a consequence, the position of the central concentric circle 13e in the radius direction (position in the radius direction) located in the center of an interval between the two concentric circles 13c and 13d forming the virtual region 13 is $0.7r$ --.

The second paragraph on page 12 of the specification has been rewritten as follows:

-- Although in the above embodiment, the gullet bottom of the circular saw blade is formed uniformly, the gullet bottom may be nonuniform ~~nonuniform~~ and in that case, as the value of r, the maximum gullet bottom radius is used. In the above-described

embodiment, generation of vibration is intended to be suppressed while maintaining the stiffness and critical revolution number appropriately by specifying the slit to be provided in the circular saw blade. Such a slit specifying condition is not restricted to the circular saw blade but applied to other disc-shaped rotation cutting tools, for example, a disc cutting grinding stone, a circular slitter knife and the like.--

In the Title

The title has been rewritten as follows:

--Disk-Shaped Tool with Vibration Reduction--.

In the Drawings

3. The following changes to the drawings have been approved by the examiner and agreed upon by applicant:

In Figure 1, the line indicated by "14" will be extended to contact the dashed line of "13b" (as shown in Figure 2).

In Figure 2, a lead line will be added to "11a" (as shown in Figure 1); angle label θ_r (i.e., theta sub "r") will be added to indicate the virtual angle region.

In order to avoid abandonment of the application, applicant must make these above agreed upon drawing changes.

Remarks

4. Claim 1 has been amended to more clearly distinguish the claimed invention. Due to the allowability of claim 1, the restriction requirement has been **withdrawn** and claim 4 has been rejoined. The specification has been amended for further clarity. The title has been amended to be more informative. The drawings will be amended to correct informalities.

Reasons for Allowance

5. The following is an examiner's statement of reasons for allowance:

The prior art of record, either taken alone or in combination, does not teach or fairly suggest the claimed invention. For example, the closest prior art is German Publication 196 48 129, Figure 1 and Woo et al., PG Pub. No. 2005/0193866, Figures 9-11, which disclose slit configurations that are similar to the claimed slit configuration. However, neither these references nor any of the other prior art of record, either taken alone or in combination, teaches or fairly suggests the claimed slit configuration and the relationship between the slit and the concentric circles, particularly "wherein each end portion of each slit extends so as to form an arc that is substantially coincident with a respective one of the concentric circles."

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLARK F. DEXTER whose telephone number is (571)272-4505. The examiner can normally be reached on Monday, Tuesday, Thursday and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Boyer D. Ashley can be reached on 571-272-4502. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/CLARK F DEXTER/
Primary Examiner, Art Unit 3724**

cfd
July 12, 2011